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A CURIOUS MATHEMATICAL TITLE-PAGE

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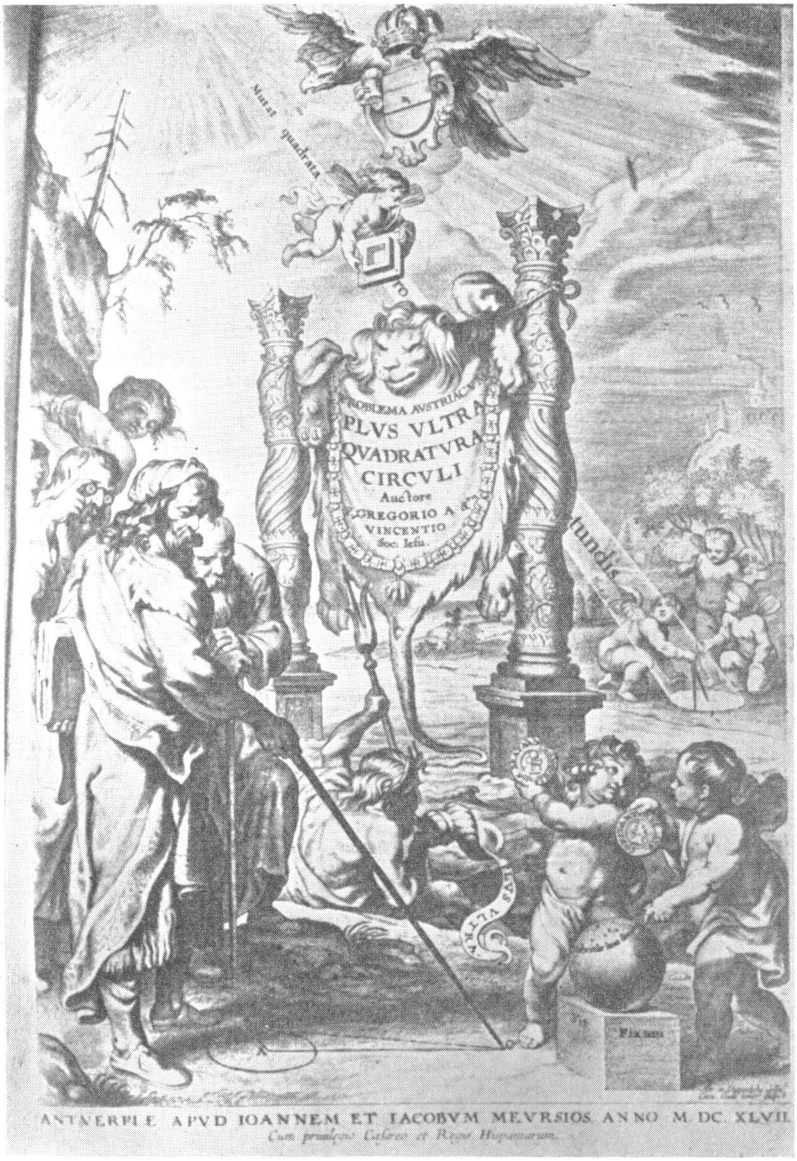
"CIRCLES to square and cubes to double would give a man excessive trouble." Thus sings old Matthew Prior, indicating that "many knotty points there are, which all discuss but few can clear." Indeed, hundreds of would-be pathfinders of the intellect, from the time of Anaxagoras down to ours, have gone into ecstasy in the belief that they had solved the impossible problem of the squaring of the circle, only perhaps later to be cast into the depths of disappointment upon learning of their failure. Many have died under the delusion that they had accomplished the impossible.

The problem of the quadrature of the circle presents a strange phenomenon in the history of thought. A geometric construction is to be effected on very definite assumptions and restrictions—the use of a pair of compasses and an ungraduated ruler.

One element of strangeness lies in the fact that the problem has no bearing whatever on practical life. The mathematician and engineer can compute the area of a circle to any desired degree of approximation; if they wish, they can carry approximations to hundreds of decimal places, although five or six places suffice in practice.

Another feature constitutes a source of pride to present-day mathematicians. Unlike some philosophical questions which are as far from solution now as they were aeons ago, the circle-problem, after thousands of years of intellectual effort, has been finally and definitely conquered; in 1882 it was proved by conclusive demonstration accepted by all trained mathematicians, that, under the restrictions imposed, the circle can not be squared.

One item of interest, in connection with the quadrature of the circle, is not generally known. The problem suggested an illustrated title-page which is perhaps the most unique that has ever adorned a mathematical book. In 1647 the Flemish Jesuit mathematician, Gregory St. Vincent, published a wonderful geometry, containing genuine pearls of new geometric truth, but unfortunately also a false diamond, the quadrature of the circle. We reproduce the title-page, which presents to the eye the nature of



For this photograph I am indebted to Professor H. Bosmans, S. J., of Brussels.

THE ENGRAVED TITLE PAGE OF GREGORY ST. VINCENT'S *QUADRATURA CIRCULI*, ANTWERP, 1647 our obstruse problem. Seldom has a subtle abstract question found such striking concrete illustration. In the fore-ground are three bearded men in old-time garb. One of them with staff in hand has just drawn upon the ground, a circle and an equivalent triangle. On the right, the sphere and the cube suggest among other things the accomplished cubature of the sphere. As if these two drawings were not sufficient reference to the solution of the great problem, there is shown also the transmutation of the square and circle into each other by the solar beam of light passing through the square opening in a board and forming upon the ground below, a circular illuminated area. *Mutat quadrata rotundis.* One of the cherubs indicates by a pair of compasses that the figure is a circle. Another gives vivid evidence of surprise and delight. We omit descriptions of the twisted and fluted columns and other details, and only point out the challenge which this engraving makes to modern pedagogues, to equal or surpass, if they can, this powerful appeal to the eye.

Recently the present writer experienced a surprise by the discovery that this same title-page (with only very slight changes in unimportant details) was appropriated sixty years later in an edition of the collected works of another noted Jesuit mathematician, Andreas Tacquet. This edition appeared at Antwerp in 1707, some years after the death of Tacquet. Hence this ''borrowing'' was done by the editors and publishers. Evidently the novelty and impressiveness of the picture appealed to them so strongly that they used it in Tacquet's works even though this mathematician is not associated with the problem of squaring the circle. Tacquet is known chiefly as a teacher and as the editor of an edition of *Euclid* which was translated into English and used in Great Britain as a school book for the larger part of a century. The title-page of the 1707 publication represents therefore the transfer of a fanciful portal originally opening into the mystic realm of transcendental mathematics, to a well-trodden avenue leading to elementary schools.